

GS/ECON 5300 Assignment 1
due : Wed. January 25 before class

do all 5 questions : all count equally

1. A country contains only two types of people, rich and poor. The gross income of each type is fixed. However, the number of rich people is not fixed : it is a decreasing function of the net-of-tax income of rich people (as rich people emigrate in response to lower incomes). If taxes collected from the rich are given to the poor, what tax rate on rich people's income maximizes the welfare of poor people?

2. Suppose that a person lives for 2 periods, 0 and 1, receiving the exogenous certain income stream (Y_0, Y_1) in each of the two periods. If her preferences over present and future consumption can be represented by the utility function

$$U(C_0, C_1) = -\frac{1}{C_0} - \frac{1}{C_1}$$

which of the following is true? — (a) her saving must be an increasing function of its net rate of return (b) her saving must be a decreasing function of its net rate of return (c) her saving could increase or decrease with its net rate of return — Explain your answer.

3. What is the elasticity of current saving, with respect to a permanent change in the tax rate on the return to saving, of someone who works for T_1 years, and then is retired for T_2 years, if her (exogenous, certain) income in year t is

$$y_t = y_0 e^{\gamma t}$$

and if her lifetime utility is defined by

$$U = \int_0^{T_1+T_2} e^{-\rho t} \ln c_t dt$$

where c_t is her consumption rate t periods after she begins her working life, where γ and ρ are both positive parameters, and where the net return to saving $(1 - \tau)r$ is greater than ρ (where τ is the tax rate on the return to saving, and r the gross interest rate), and less than γ ?

4. How would an individual's investment in a risky asset vary with the tax rate t on the net return to investment if her utility-of-wealth function was $u(W) = \ln W$ and she had a fixed initial wealth to divide between a risky asset and a safe asset and the safe asset earned a sure net rate of return r_0 ; and the risky asset earned a return $r_g > r_0$ with probability π , and a return $r_b < r_0$ with probability $1 - \pi$?

5. Re-do question #4 above if the return r_b in the bad state were negative, and if the tax authorities did not allow any deductions from tax for investment losses.